STIC Biotechnology Systems Branch

RAW SEQUENCE LISTING
ERROR REPORT

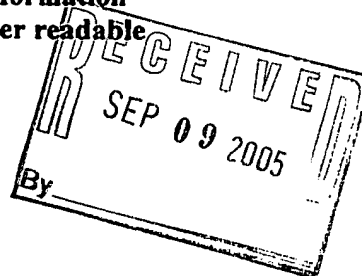*[Stamp: OIPE JAN 2 6 2006 PATENT & TRADEMARK OFFICE]*

The Biotechnology Systems Branch of the Scientific and Technical Information Center (STIC) detected errors when processing the following computer readable form:

[Stamp: RECEIVED SEP 09 2005 By]

Application Serial Number: _10/797,553C_

Source: _TYWO_

Date Processed by STIC: _8/29/05_

THE ATTACHED PRINTOUT EXPLAINS DETECTED ERRORS.
PLEASE FORWARD THIS INFORMATION TO THE APPLICANT BY EITHER:
1) INCLUDING A COPY OF THIS PRINTOUT IN YOUR NEXT COMMUNICATION TO THE APPLICANT, WITH A NOTICE TO COMPLY or,
2) TELEPHONING APPLICANT AND FAXING A COPY OF THIS PRINTOUT, WITH A NOTICE TO COMPLY
FOR CRF SUBMISSION AND PATENTIN SOFTWARE QUESTIONS, PLEASE CONTACT MARK SPENCER, TELEPHONE: 571-272-2510; FAX: 571-273-0221

TO REDUCE ERRORED SEQUENCE LISTINGS, PLEASE USE THE **CHECKER VERSION 4.2.2 PROGRAM**, ACCESSIBLE THROUGH THE U.S. PATENT AND TRADEMARK OFFICE WEBSITE. SEE BELOW FOR ADDRESS:
   http://www.uspto.gov/web/offices/pac/checker/chkrnote.htm

Applicants submitting genetic sequence information electronically on diskette or CD-Rom should be aware that there is a possibility that the disk/CD-Rom may have been affected by treatment given to all incoming mail.
Please consider using alternate methods of submission for the disk/CD-Rom or replacement disk/CD-Rom.
Any reply including a sequence listing in electronic form should NOT be sent to the 20231 zip code address for the United States Patent and Trademark Office, and instead should be sent via the following to the indicated addresses:

1. EFS-Bio (<http://www.uspto.gov/ebc/efs/downloads/documents.htm> , EFS Submission User Manual - ePAVE)
2. U.S. Postal Service: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
3. Hand Carry, Federal Express, United Parcel Service, or other delivery service (EFFECTIVE 01/14/05): U.S. Patent and Trademark Office, Mail Stop Sequence, Customer Window, Randolph Building, 401 Dulany Street, Alexandria, VA 22314

Revised 01/24/05

Raw Sequence Listing Error Summary

ERROR DETECTED   **SUGGESTED CORRECTION**   SERIAL NUMBER: _10/797,533_

ATTN: NEW RULES CASES: PLEASE DISREGARD ENGLISH "ALPHA" HEADERS, WHICH WERE INSERTED BY PTO SOFTWARE

1. _____Wrapped Nucleics   The number/text at the end of each line "wrapped" down to the next line. This may occur if your file
   Wrapped Aminos   was retrieved in a word processor after creating it. Please adjust your right margin to .3; this will
   prevent "wrapping."

2. _____Invalid Line Length   The rules require that a line not exceed 72 characters in length. This includes white spaces.

3. _____Misaligned Amino   The numbering under each 5th amino acid is misaligned. Do not use tab codes between numbers;
   Numbering   use space characters, instead.

4. _____Non-ASCII   The submitted file was not saved in ASCII(DOS) text, as required by the Sequence Rules. Please
   ensure your subsequent submission is saved in ASCII text.

5. _____Variable Length   Sequence(s) _56_ contain n's or Xaa's representing more than one residue. Per Sequence Rules,
   each n or Xaa can only represent a single residue. Please present the maximum number of each
   residue having variable length and indicate in the <220>-<223> section that some may be missing.

6. _____PatentIn 2.0   A "bug" in PatentIn version 2.0 has caused the <220>-<223> section to be missing from amino acid
   "bug"   sequences(s) _____. Normally, PatentIn would automatically generate this section from the
   previously coded nucleic acid sequence. Please manually copy the relevant <220>-<223> section to
   the subsequent amino acid sequence. This applies to the mandatory <220>-<223> sections for
   Artificial or Unknown sequences.

7. _____Skipped Sequences   Sequence(s) _____ missing. If intentional, please insert the following lines for each skipped sequence:
   (OLD RULES)   (2) INFORMATION FOR SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
   (i)   SEQUENCE CHARACTERISTICS: (Do not insert any subheadings under this heading)
   (xi) SEQUENCE DESCRIPTION:SEQ ID NO:X: (insert SEQ ID NO where "X" is shown)
   This sequence is intentionally skipped

   Please also adjust the "(ii) NUMBER OF SEQUENCES:" response to include the skipped sequences.

8. _____Skipped Sequences   Sequence(s) _____ missing. If intentional, please insert the following lines for each skipped sequence.
   (NEW RULES)   <210> sequence id number
   <400> sequence id number
   000

9. _____Use of n's or Xaa's   Use of n's and/or Xaa's have been detected in the Sequence Listing.
   (NEW RULES)   Per 1.823 of Sequence Rules, use of <220>-<223> is MANDATORY if n's or Xaa's are present.
   In <220> to <223> section, please explain location of n or Xaa, and which residue n or Xaa represents.

10. _____Invalid <213>   Per 1.823 of Sequence Rules, the only valid <213> responses are: Unknown, Artificial Sequence, or
    Response   scientific name (Genus/species). <220>-<223> section is required when <213> response is Unknown or
    is Artificial Sequence

11. _____Use of <220>   Sequence(s) _____ missing the <220> "Feature" and associated numeric identifiers and responses.
    Use of <220> to <223> is MANDATORY if <213> "Organism" response is "Artificial Sequence" or
    "Unknown." Please explain source of genetic material in <220> to <223> section.
    (See "Federal Register," 06/01/1998, Vol. 63, No. 104, pp. 29631-32)   (Sec. 1.823 of Sequence Rules)

12. _____PatentIn 2.0   Please do not use "Copy to Disk" function of PatentIn version 2.0. This causes a corrupted file,
    "bug"   resulting in missing mandatory numeric identifiers and responses (as indicated on raw sequence
    listing). Instead, please use "File Manager" or any other manual means to copy file to floppy disk.

13. _____Misuse of n/Xaa   "n" can only represent a single nucleotide; "Xaa" can only represent a single amino acid

AMC – Biotechnology Systems Branch – 09/09/2003

BEST AVAILABLE COPY

IFWO

RAW SEQUENCE LISTING	DATE: 08/29/2005
PATENT APPLICATION: US/10/797,553C	TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
   3 <110> APPLICANT: Moyle, William R.
   4        Xing, Yongna
   6 <120> TITLE OF INVENTION: Protein Knobs
   8 <130> FILE REFERENCE: 1092/US PCT
  10 <140> CURRENT APPLICATION NUMBER: 10/797,553C
  11 <141> CURRENT FILING DATE: 2004-03-10
  13 <160> NUMBER OF SEQ ID NOS: 66
  15 <170> SOFTWARE: PatentIn version 3.1
```

**Does Not Comply
Corrected Diskette Needed**
(Pg.1-10)

ERRORED SEQUENCES

```
1163 <210> SEQ ID NO: 36
1164 <211> LENGTH: 145
1165 <212> TYPE: PRT
1166 <213> ORGANISM: Homo sapiens
1168 <400> SEQUENCE: 36

1170 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1171 1               5                   10                  15
1174 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1175             20                  25                  30
1178 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1179             35                  40                  45
1182 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1183         50                  55                  60
1186 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
1187 65                  70                  75                  80
1190 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1191             85                  90                  95
1194 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
1195             100                 105                 110
1198 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1199             115                 120                 125
1202 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 1203         130                 135                 140            145
1206 <210> SEQ ID NO: 37
1207 <211> LENGTH: 145
1208 <212> TYPE: PRT
1209 <213> ORGANISM: Artificial Sequence
1211 <220> FEATURE:
1212 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser138
1214 <400> SEQUENCE: 37
1216 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
```

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
1217 1                    5                    10                   15
1220 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1221          20                   25                   30
1224 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1225          35                   40                   45
1228 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1229      50                   55                   60
1232 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
1233 65                   70                   75                   80
1236 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1237              85                   90                   95
1240 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
1241          100                  105                  110
1244 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1245      115                  120                  125
1248 Pro Ser Pro Ser Arg Leu Pro Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
```
E--> 1249   130   135   140   *H/S*

```
1252 <210> SEQ ID NO: 38
1253 <211> LENGTH: 145
1254 <212> TYPE: PRT
1255 <213> ORGANISM: Artificial Sequence
1257 <220> FEATURE:
1258 <223> OTHER INFORMATION: hCG beta-subunit residues 101-114 were replaced with their
```
hFSH b
```
1259         eta-subunit counterparts, namely hFSH beta-subunit residues 95-10
1260      8
1262 <400> SEQUENCE: 38
1264 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1265 1                    5                    10                   15
1268 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1269          20                   25                   30
1272 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1273          35                   40                   45
1276 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1277      50                   55                   60
1280 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
1281 65                   70                   75                   80
1284 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1285              85                   90                   95
1288 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
1289          100                  105                  110
1292 Gly Glu Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1293          115                  120                  125
1296 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
```
E--> 1297   130   135   140   *1/9/S*

```
1300 <210> SEQ ID NO: 39
1301 <211> LENGTH: 145
1302 <212> TYPE: PRT
1303 <213> ORGANISM: Artificial Sequence
1305 <220> FEATURE:
```

1306 <223> OTHER INFORMATION: hCG beta-subunit residues 101-114 were replaced with their
hFSH b
1307   eta-subunit counterparts, namely hFSH beta-subunit residues 95-10
1308   8, and Serine38 in the beta-subunit carboxyterminus of this
1309   analog was replaced with Cys
1311 <400> SEQUENCE: 39
1313 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1314 1   5   10   15
1317 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1318   20   25   30
1321 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1322   35   40   45
1325 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1326   50   55   60
1329 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
1330 65   70   75   80
1333 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1334   85   90   95
1337 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
1338   100   105   110
1341 Gly Glu Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1342   115   120   125
1345 Pro Ser Pro Ser Arg Leu Pro Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
E--> 1346   130   135   140   *1YS*
1709 <210> SEQ ID NO: 45
1710 <211> LENGTH: 125
1711 <212> TYPE: PRT
1712 <213> ORGANISM: Artificial Sequence
1714 <220> FEATURE:
1715 <223> OTHER INFORMATION: hCGbeta,delta116-135,S138C
1717 <400> SEQUENCE: 45
1719 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1720 1   5   10   15
1723 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1724   20   25   30
1727 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1728   35   40   45
1731 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1732   50   55   60
1735 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
1736 65   70   75   80
1739 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1740   85   90   95
1743 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
1744   100   105   110
1747 Pro Arg Phe Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
E--> 1748   115   120   *125*
1843 <210> SEQ ID NO: 48
1844 <211> LENGTH: 140
1845 <212> TYPE: PRT

RAW SEQUENCE LISTING   DATE: 08/29/2005
PATENT APPLICATION: US/10/797,553C   TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
1846 <213> ORGANISM: Artificial Sequence
1848 <220> FEATURE:
1849 <223> OTHER INFORMATION: hCGbeta,delta131-135,S138C
1851 <400> SEQUENCE: 48
1853 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
1854 1               5                  10                  15
1857 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
1858             20                  25                  30
1861 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
1862         35                  40                  45
1865 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
1866     50                  55                  60
1869 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Asn Pro Val Val
1870 65                  70                  75                  80
1873 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
1874             85                  90                  95
1877 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
1878             100                 105                 110
1881 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
1882     115                 120                 125
1885 Pro Ser Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
1886     130                 135
2123 <210> SEQ ID NO: 56
2124 <211> LENGTH: 10
2125 <212> TYPE: PRT
2126 <213> ORGANISM: Artificial Sequence
2128 <220> FEATURE:
2129 <223> OTHER INFORMATION: Xl-Asp-Asp-Asp-Asp-Lys-Ser-Ym-Cys-Zn, where X, Y, and Z
refer to
2130     any tail portion amino acids and l, m, and n refer to the lengths
2131     of the tail portion amino acids
2133 <220> FEATURE:
2134 <221> NAME/KEY: MISC_FEATURE
2135 <223> OTHER INFORMATION: Xaa refers to any tail portion amino acids and n refers to
the
2136     lengths of the tail portion amino acids
2140 <400> SEQUENCE: 56
2142 Xaa Asp Asp Asp Asp Lys Ser Xaa Cys Xaa
2143 1               5                  10
2147 <210> SEQ ID NO: 57
2148 <211> LENGTH: 92
2149 <212> TYPE: PRT
2150 <213> ORGANISM: Artifical Sequence
2152 <220> FEATURE:
2153 <223> OTHER INFORMATION: An hCG truncated (-subunit analog fused to the hCG alpha-
carboxyterminus
2155 <400> SEQUENCE: 57
2157 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
2158 1               5                  10                  15
2160 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
2161             20                  25                  30
2163 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
```

(handwritten annotations):
140

pls explain source of genetic material.

See item #5 on error summary sheet, N's are not permitted in the sequence.

107 found

These amino acids are misaligned, pls see item #3 on error summary sheet

RAW SEQUENCE LISTING   DATE: 08/29/2005
PATENT APPLICATION: US/10/797,553C   TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
2164           35                40                45
2166 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
2167      50                55                60
2169 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
2170 65                70                75                80
2172 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser Asp Asp Pro Arg
2173 85 90          85        95        70                    98
2175 Phe Gly Pro Cys Asp Thr Pro Ile Leu Pro Gln
2176 100 105      100               105
     <210> SEQ ID NO: 58
2178 <211> LENGTH: 145
2179 <212> TYPE: PRT
2180 <213> ORGANISM: Artificial Sequence
2181
2183 <220> FEATURE:
2184 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Arg94
2186 <400> SEQUENCE: 58
2188 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2189 1              5                10              15
2192 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2193           20                25                30
2196 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2197           35                40                45
2200 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2201      50                55                60
2204 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2205 65                70                75                80
2208 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Cys Arg Ser
2209                85                90                95
2212 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2213           100               105               110
2216 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2217           115               120               125
2220 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
2221      130               135               140               145
     <210> SEQ ID NO: 59
2224 <211> LENGTH: 145
2225 <212> TYPE: PRT
2226 <213> ORGANISM: Artificial Sequence
2227
2229 <220> FEATURE:
2230 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Arg95
2232 <400> SEQUENCE: 59
2234 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2235 1              5                10              15
2238 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2239           20                25                30
2242 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2243           35                40                45
2246 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2247      50                55                60
```

[handwritten annotation: ← misaligned numbering]

RAW SEQUENCE LISTING   DATE: 08/29/2005
PATENT APPLICATION: US/10/797,553C   TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
      2250 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
      2251 65              70              75              80
      2254 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Cys Ser
      2255             85              90              95
      2258 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
      2259             100             105             110
      2262 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
      2263         115             120             125
      2266 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2267     130             135             140
      2270 <210> SEQ ID NO: 60
      2271 <211> LENGTH: 145
      2272 <212> TYPE: PRT
      2273 <213> ORGANISM: Artificial Sequence
      2275 <220> FEATURE:
      2276 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser96
      2278 <400> SEQUENCE: 60
      2280 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
      2281 1               5               10              15
      2284 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
      2285             20              25              30
      2288 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
      2289             35              40              45
      2292 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
      2293         50              55              60
      2296 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
      2297 65              70              75              80
      2300 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Cys
      2301             85              90              95
      2304 Thr Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
      2305             100             105             110
      2308 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
      2309         115             120             125
      2312 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2313     130             135             140
      2315 <210> SEQ ID NO: 61
      2316 <211> LENGTH: 145
      2317 <212> TYPE: PRT
      2318 <213> ORGANISM: Artificial Sequence
      2320 <220> FEATURE:
      2321 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Thr97
      2323 <400> SEQUENCE: 61
      2325 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
      2326 1               5               10              15
      2329 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
      2330             20              25              30
      2333 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
      2334             35              40              45
      2337 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
```

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

```
2338      50                55                 60
2341 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2342 65                70                 75                 80
2345 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2346                85                 90                 95
2349 Cys Thr Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2350             100                105                110
2353 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2354          115                120                125
2357 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2358     130                135                140
2360 <210> SEQ ID NO: 62
2361 <211> LENGTH: 145
2362 <212> TYPE: PRT
2363 <213> ORGANISM: Artificial Sequence
2365 <220> FEATURE:
2366 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Thr98
2368 <400> SEQUENCE: 62
2370 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2371 1              5                 10                 15
2374 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2375             20                 25                 30
2378 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2379          35                 40                 45
2382 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2383      50                55                 60
2386 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2387 65                70                 75                 80
2390 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2391                85                 90                 95
2394 Thr Cys Asp Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2395             100                105                110
2398 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2399          115                120                125
2402 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2403     130                135                140
2405 <210> SEQ ID NO: 63
2406 <211> LENGTH: 145
2407 <212> TYPE: PRT
2408 <213> ORGANISM: Artificial Sequence
2410 <220> FEATURE:
2411 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Asp99
2413 <400> SEQUENCE: 63
2415 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
2416 1              5                 10                 15
2419 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
2420             20                 25                 30
2423 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
2424          35                 40                 45
```

```
2427 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
2428     50              55                 60
2431 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
2432 65              70                 75                 80
2435 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Ser
2436             85                 90                 95
2439 Thr Thr Cys Cys Gly Gly Pro Lys Asp His Pro Leu Thr Cys Asp Asp
2440         100             105             110
2443 Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
2444     115             120             125
2447 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
2448     130             135             140        145
2450 <210> SEQ ID NO: 64
2451 <211> LENGTH: 95
2452 <212> TYPE: PRT
2453 <213> ORGANISM: Artifical Sequence
2455 <220> FEATURE:
2456 <223> OTHER INFORMATION: An hCG alpha-subunit analog with Gly-Gly-Cys at its
carboxyterminus
2458 <400> SEQUENCE: 64
2460 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
2461 1               5                 10              15
2463 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
2464             20                 25              30
2466 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
2467         35                 40              45
2469 Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
2470     50              55                 60
2472 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
2473 65              70                 75              80
2475 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser Gly Gly Cys
2476 86  90              85     95              90              95
2479 <210> SEQ ID NO: 65
2480 <211> LENGTH: 92
2481 <212> TYPE: PRT
2482 <213> ORGANISM: Artifical Sequence
2484 <220> FEATURE:
2485 <223> OTHER INFORMATION: An hCG alpha-subunit analog with Asp in place of Asn52 and
Cys in place of Ser92
2487 <400> SEQUENCE: 65
2489 Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Leu Gln Glu Asn Pro
2490 1               5                 10              15
2492 Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
2493             20                 25              30
2495 Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
2496         35                 40              45
2498 Val Gln Lys Asp Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
2499     50              55                 60
2501 Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
2502 65              70                 75              80
2504 Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
                    85                 90
```

RAW SEQUENCE LISTING   DATE: 08/29/2005
PATENT APPLICATION: US/10/797,553C   TIME: 15:32:06

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

E--> 2505 87 90
     2508 <210> SEQ ID NO: 66
     2509 <211> LENGTH: 145
     2510 <212> TYPE: PRT
     2511 <213> ORGANISM: Artificial Sequence
     2513 <220> FEATURE:
     2514 <223> OTHER INFORMATION: hCG beta-subunit with Cys substituted for Ser96 and hFSH
beta-subunit residues 95-108 for hCG beta-subunit residues 101-108
     2516 <400> SEQUENCE: 66
     2518 Ser Lys Glu Pro Leu Arg Pro Arg Cys Arg Pro Ile Asn Ala Thr Leu
     2519 1   5   10   15
     2522 Ala Val Glu Lys Glu Gly Cys Pro Val Cys Ile Thr Val Asn Thr Thr
     2523   20   25   30
     2526 Ile Cys Ala Gly Tyr Cys Pro Thr Met Thr Arg Val Leu Gln Gly Val
     2527   35   40   45
     2530 Leu Pro Ala Leu Pro Gln Val Val Cys Asn Tyr Arg Asp Val Arg Phe
     2531   50   55   60
     2534 Glu Ser Ile Arg Leu Pro Gly Cys Pro Arg Gly Val Pro Asn Val Val
     2535 65   70   75   80
     2538 Ser Tyr Ala Val Ala Leu Ser Cys Gln Cys Ala Leu Cys Arg Arg Cys
     2539   85   90   95
     2542 Thr Thr Asp Cys Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe
     2543   100   105   110
     2546 Gly Glu Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro Pro Pro Ser Leu
     2547   115   120   125
     2550 Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr Pro Ile Leu Pro Gln
E--> 2551   130   135   140   145
E--> 2556 4

pls delete

```
<210>   8
<211>   92
<212>   PRT
<213>   Artificial Sequence

<220>
<223>   hCG alpha-subunit with Cys subsituted for Leu22
```

(handwritten annotation: Gly is at this location.)

```
<400>   8

Ala Pro Asp Val Gln Asp Cys Pro Glu Cys Thr Cys Gln Glu Asn Pro
1               5                   10                  15

Phe Phe Ser Gln Pro Gly Ala Pro Ile Leu Gln Cys Met Gly Cys Cys
            20                  25                  30

Phe Ser Arg Ala Tyr Pro Thr Pro Leu Arg Ser Lys Lys Thr Met Leu
        35              40                  45

Val Gln Lys Asn Val Thr Ser Glu Ser Thr Cys Cys Val Ala Lys Ser
    50                  55                  60

Tyr Asn Arg Val Thr Val Met Gly Gly Phe Lys Val Glu Asn His Thr
65                  70                  75                  80

Ala Cys His Cys Ser Thr Cys Tyr Tyr His Lys Ser
                85                  90
```

(handwritten note in circle): The type of errors shown exist throughout the Sequence Listing. Please check subsequent sequences for similar errors.

RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 08/29/2005
PATENT APPLICATION: US/10/797,553C   TIME: 15:32:07

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

<u>Invalid Line Length:</u>
The rules require that a line not exceed 72 characters in length. This includes spaces.

Seq#:57; Line(s) 2153
Seq#:65; Line(s) 2485
Seq#:66; Line(s) 2514

VARIABLE LOCATION SUMMARY   DATE: 08/29/2005
PATENT APPLICATION: US/10/797,553C   TIME: 15:32:07

Input Set : A:\SEQUENCE LISTING.1092.txt
Output Set: N:\CRF4\08292005\J797553C.raw

Use of n's or Xaa's(NEW RULES): OK
Use of n's and/or Xaa's have been detected in the Sequence Listing.
Use of <220> to <223> is MANDATORY if n's or Xaa's are present.
in <220> to <223> section, please explain location of n or Xaa, and which
residue n or Xaa represents.

Input Set : **A:\SEQUENCE LISTING.1092.txt**
Output Set: **N:\CRF4\08292005\J797553C.raw**

```
L:1203 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:36
L:1249 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:37
L:1297 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:38
L:1346 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:39
L:1748 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:45
L:1886 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:48
L:2142 M:258 W: Mandatory Feature missing, <222> Tag not found for SEQ ID#:56
L:2142 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:56 after pos.:0
L:2142 M:333 E: Wrong sequence grouping, Amino acids not in groups!
L:2143 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:56
L:2150 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:57
L:2173 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:57
M:332 Repeated in SeqNo=57
L:2176 M:252 E: No. of Seq. differs, <211> LENGTH:Input:92 Found:107 SEQ:57
L:2221 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:58
L:2267 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:59
L:2313 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:60
L:2358 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:61
L:2403 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:62
L:2448 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:63
L:2453 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:64
L:2476 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:64
L:2482 M:220 C: Keyword misspelled or invalid format, <213> ORGANISM for SEQ ID#:65
L:2505 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:65
L:2551 M:332 E: (32) Invalid/Missing Amino Acid Numbering, SEQ ID:66
M:332 Repeated in SeqNo=66
```